UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,426	01/27/2004	Jean-Michel Larrieu	BDL-445XX	1527

207 7590 11/29/2006

WEINGARTEN, SCHURGIN, GAGNEBIN & LEBOVICI LLP
TEN POST OFFICE SQUARE
BOSTON, MA 02109

EXAMINER	
ABOAGYE, MICHAEL	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/765,426	LARRIEU ET AL.	
	Examiner	Art Unit	
	Michael Aboagye	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-3, 5, 6,11-14 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al. (US Patent No. 6,182,442) in view of Vidal et al. (US Patent no. 6,397,581).

Schmidt et al. teaches a method of manufacturing an active cooling panel, the method comprising the steps of providing a first part of thermostructural composite material having an inside face presenting indentations forming channels, forming a coating on said face of the first part, providing a second part of thermostructural

composite material having an inside face for application on said inside face of the first part, forming a coating on said inside face of the second part to ensure leak proof and also aid bonding, and assembling the first and second parts together by bonding said inside faces together, thereby obtaining a cooling panel of thermostructural composite material having integrated fluid flow channels, wherein the parts are assembled together by bonding said inside faces together by hot compression; wherein the bonding is implemented by pressing the parts in a hot press; wherein the bonding is implemented by hot isostatic pressing; wherein the metal coating is formed at least in part by physical vapor deposition or plasma sputtering (Note the metal coating is interpreted to include, metal powder or foil); wherein the parts to be assembled together are made of ceramic matrix composite material in which the matrix is constituted at least in part by silicon carbide (see, abstract, figures 1-2B, column 3, line 1- column 5, line 27 and column 6, line 11-column 7, line 53).

Schmidt et al. does not expressly teach a metal coating nor performing treatment to reduce the surface porosity of the thermostructural composite material on at least one of the said inside faces prior to forming the metal coatings on said inside faces of the parts to be assembled together.

However, Vidal et al. teaches a method of manufacturing an active cooling panel, the method comprising the steps of providing a first part of thermostructural composite material, providing a second part of thermostructural composite material having an inside face for application on said inside face of the first part, interposed therebetween the first and the second thermostructural composite materials, a composite material in which fluid circulating channels are formed; forming a metal coating on said inside face

of the second part, and assembling the first and second parts together by bonding said inside faces together, wherein the parts are assembled together by bonding said inside faces together by brazing; wherein the metal coatings are formed by forming first and second superposed deposits, the first deposit having a function of forming a reaction barrier between the components of the thermostructural composite material and the second deposit, and/or a function of matching thermal expansion, and the second deposit contributing to bonding between the parts by brazing; wherein, prior to forming the metal coatings on said inside faces of the parts to be assembled together, treatment is performed to reduce the surface porosity of the thermostructural composite material on at least one of said inside faces; wherein said porosity-reducing treatment comprises: applying a suspension to at least one of said inside faces of the parts, the suspension comprising a ceramic powder and a ceramic material precursor in solution, and transforming the precursor into ceramic material; wherein the ceramic material precursor is a polymer which is cross-linked and transformed into ceramic by heat treatment; wherein, after transforming the precursor into ceramic material and prior to forming the metal coating, a ceramic deposit is made by chemical vapor infiltration or deposition on said inside faces of the parts to be assembled together (see, Vidal et al., abstract, figures 1-4, column 1, line 43- column 2, line 47, column 3, line 1-column 5, line 25).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to have modified the method of Schmidt et al. by including the densification step as taught by Vidal et al. and also as well know in the art

in order to reduce porosity of the thermostructural composite (see vidal et al. column 3, lines 40 – 67).

4. Claims 7, 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al. (US Patent No. 6,182,442) in view of Vidal et al. (US Patent no. 6,397,581) and further in view of Walsh (EP 0306140).

Schmidt et al. in view of Vidal et al disclose and/or suggest the elements of claims 1, 6 and 13 but do not expressly teach a first coating the selected from the group consisting of rhenium, molybdenum, tungsten, niobium, and tantalum.

However, Walsh discloses a method of forming a honeycomb structure from a thermostructural composite made of Sic, and applying by chemical vapor deposition a first coating of refractory material, to enhance the physical and thermal properties of the thermostructural composite and furthermore providing pressure sealed/permeability barrier, wherein said refractory material is a refractory metal including rhenium (note the limitation calling for refractory metal disclosed by Walsh is considered as a generic term which includes molybdenum, tungsten, niobium, and tantalum(see Walsh, abstract, page 3, lines 1-36 and page 4, line 1- page 5, line 58).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to have applied a first coating of a refractory material on the inside faces of the thermostructural composite parts of Schmidt et al. cooling panel as modified by Vidal et al. in view of Walsh in order to enhance the physical and thermal properties of the thermostructural composite and furthermore providing a pressure

sealed/permeability barrier, wherein said refractory material is a refractory metal including rhenium (see Walsh, abstract, page 3, lines 1-36).

5. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al. (US Patent No. 6,182,442) in view of Vidal et al (US Patent no. 6,397,581) and further in view of Jahnke (US Patent No. 4,611,752).

Schmidt et al. in view of Vidal et al disclose and/or suggest the elements of claims 1 and 4 but do not expressly teach a metal layer enabling bonding by hot compression.

However, Jahnke teaches a method of manufacturing a gas turbine from a first and a second component by hot compression or hot isostatic pressing by applying a brazing foil, powder or layer on the surface of the joining components to promote bonding, wherein the brazing foil, layer or powder comprises Nickel and nickel based alloy (see, Jahnke, column 1, line1 – column 2,line 17, column 4, line 1- column 5, line 37 and figures 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to have applied a layer of nickel or nickel–based alloy on the inside faces of the thermostructural composite parts of Schmidt et al. cooling panel as modified by Vidal et al. in view of the teachings of Jahnke since nickel and nickel–based alloy provide excellent wetting of the surfaces of the components and therefore enhancing bonding (see, Jahnke, column 12- 45 and column 4, line 1- column 5, line 37).

Response to Arguments

6. The examiner acknowledges the applicants' amendments received by the USPTO on September 18, 2006. Claims 4 has been cancelled, therefore 1-3 and 5- 21 remain under consideration in the application.

7. Applicants' arguments filed September 18, 2006 have been fully considered but they are not persuasive. The applicant argues that the combination of Schmidt and Vidal references do not meet the claimed invention and further more that no suggestion can be derived from Schmidt et al. that metal coating such as disclosed by Vidal et al. could be directly used for achieving bonding by hot compression, eliminating the need for brazing, since Schmidt et al. discloses bonding by chemical reaction between specifically formed ceramic layers. The examiner respectfully disagrees with the applicant. Attention is directed to the fact that both Schmidt et al. and Vida et al. disclose body of the active cooling panel composed of thermostructural composite material such as set forth in the applicant's claimed invention. It should also be noted that the limitations "bonding said inside faces together by hot compression using said metal coatings" recited in applicant's claim 1 is interpreted by the examiner as having the metal coating as a bond facilitator. Schmidt et al. teaches a different bond facilitator (Schmidt et al., column 6, lines 56-61) in his hot compression process, hence what is lacking in Schmidt reference is the metal coating provided in the inside faces of the panels. The remedy Vidal et al. therefore provides for the deficiency in Schmidt et al. reference is the teaching of having a metal coating on the faying surfaces of the thermostructural composite cooling panels to be bonded together. The applicant argues

that Vidal et al. teaches brazing and not hot compression. The examiner takes note of that, but what is common to most bonding or joining processes is a medium provided at the joining faces that improves wettability and adhesion. Vidal et al. specifically discloses said metal coating as a bond facilitator and furthermore said coating making the walls of the thermostructural composite cooling panels leakproof (column, 3, lines 54-67). The motivation to modify the process of Schmidt et al. process in view of Vidal et al. teachings is very apparent in this regard. Since no substantive arguments were made against the Walsh, and Jahnke references, the rejections of claims 1-3 and 5- 21 under 35 U.S.C. 103(a) remain valid.

Conclusion

8. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael Aboagye
Assistant Examiner
Art unit 1725
11/26/2006

AM
AM

KEVIN KERNS
PRIMARY EXAMINER
Kevin Kerns 11/27/06